

Teaching Mathematics to English Language Learners

A position of the National Council of Teachers of Mathematics

Question

How can teachers support the mathematical development of all English language learners?

NCTM Position

Mathematics teachers must attend to all students, including those who speak a first language other than English or have related cultural differences, and ensure that all have access and opportunities to learn mathematics and to reveal what they know. Every student's cultural and linguistic heritage should be respected and celebrated for the diversity that it contributes to the learning environment. Expanded learning opportunities and instructional accommodations should be available to English language learners (ELLs) who need them to develop mathematical understanding and proficiency.

The student populations in U.S. and Canadian schools continue to become more diverse, with the ELL population representing the fastest growing category. For example, between the 1998–99 and 2008–2009 school years, the ELL population enrolled in U.S. schools grew from 3.5 to 5.3 million, representing a 51 percent increase (National Clearinghouse for English Language Acquisition, 2011). By contrast, during that same time period, the general student population grew by only 7.2 percent, to 49.5 million. In sum, 10.8 percent of U.S. students are English language learners. Similarly, approximately 15 percent of Canadian school-aged children are reported to have a non-official language as their first language (Riel & Boudreau, 2012). These demographic shifts indicate how important it is for teachers to ensure that all students, including ELLs, have equitable access and opportunities to learn mathematics with understanding.

To support the mathematical development of ELLs, teachers must be aware of the challenges that all students, including ELLs, may encounter as they attempt to make sense of the language of mathematics. To ensure that all students can gain access to, interpret, and share information fluently, teachers must address multiple dimensions of instruction (Kersaint, Thompson, & Petkova, 2013; Ontario Ministry of Education, 2013):

- Establish learning environments and classroom norms that support the active engagement of all students, including ELLs. Such classrooms honor the diverse ways in which students approach mathematics, communicate their mathematical thinking (e.g., code-switching [Moschkovich, 2009]), and record their strategies and solutions to exercises and problems (e.g., using alternate algorithms [Orey, 2013]). For example, in some countries, one billion is written as 10^{12} rather than as 10^9 .
- Identify and use instructional strategies that make content more accessible (Kersaint, Thompson, & Petkova, 2013; Ontario Ministry of Education, 2013), and consider how to implement culturally relevant pedagogy in mathematics classrooms (Aguirre & Zavala, 2013; Gay, 2000).

- Orchestrate classroom discussions in ways that support acquisition of mathematics concepts and language development (Smith & Stein, 2011). It is important for all students, but especially critical for ELLs, to have opportunities to speak, write, read, and listen in mathematics classes, with teachers providing appropriate linguistic support and encouragement.
- Assess ELLs in ways that permit them to show what they know and are able to do (Abedi & Sato, 2008). This requires providing test accommodations that lessen the language complexity without reducing the rigor of the mathematics under investigation.

In sum, to support ELLs, teachers must understand the current expectations for *all* students and ensure that ELLs are provided with equitable opportunities to learn the same rigorous mathematics content as their English-speaking peers.

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NCTM Resources

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